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# Biotechnology Notes

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**Biotechnology Notes**, a compilation of agency activities, news events, and upcoming meetings, is prepared for members of the U.S. Department of Agriculture's (USDA) Committee on Biotechnology in Agriculture (CBA) by USDA's Office of Agricultural Biotechnology (OAB).

## INSIDE USDA

### **BROADENING THE GERMLASM BASE: THIS SPUD'S FOR YOU**

Potatoes are just as susceptible to viruses and bacterial infections as other crop plants. In fact, the potato industry, which is estimated at \$1 to \$2 billion a year, lost on average \$100 to \$200 million a year during the last 10 years due to various diseases. Until recently, attempts at cross-hybridization between resistant and vulnerable varieties have failed because of sexual incompatibility. Now, scientists at the University of Wisconsin, in an experiment supported in part by the Cooperative State Research Service's (CSRS) Competitive Research Grants Office, have used biotechnology to solve the problem.

The team removed a small section of leaf from a wild potato species called Solanum brevidens. Although S. brevidens does not produce tubers and is incompatible with other species, it does contain genes for resistance to several important diseases. The leaf section is immersed in a solution that breaks down cell walls, leaving only the protoplasts (cells without walls). At the same time, the team immersed part of a leaf from a cultivated potato. The two groups of protoplasts were then combined, a technique referred to as somatic fusion. The resulting hybrid (yet unnamed) incorporated the disease resistant genes, produced tubers, and is fertile.

At this time, the researchers are conducting toxicity tests and evaluating the stability of the genetic trait in offspring. In addition to the possibility of broadening the germplasm base, investigators hope to establish the general usefulness of the somatic fusion technique in plant breeding.

### **INFORMATION, PLEASE**

The Biotechnology Information Center, housed at USDA's National Agricultural Library (NAL) in Beltsville, Md., provides information retrieval services for USDA employees and the general public on all aspects of agricultural biotechnology. The extensive collection includes monographs, serials, bibliographies, newspapers, and audiovisuals. The highly trained staff has access to over 300 databases.

Requests or inquiries should be referred to the Biotechnology Information Center, NAL, Rm. 301, Beltsville, Md. 20705, or call (301) 344-3218 or (301) 344-1215.

## A BROCHURE ON INTERNATIONAL EXCHANGES

OAB, the Office of International Cooperation and Development, and CSRS are developing a brochure to advise U.S. researchers on the pros and cons of scientific information exchanges in international research activities involving biotechnology. A recent workshop, attended by program managers from seven USDA agencies, resulted in an extensive list of issues, now being streamlined into brochure format. A draft of the brochure will soon be ready for review by USDA's Committee on Biotechnology in Agriculture.

## NEWS AROUND THE COUNTRY (AND THE WORLD)

### CALLING FOR A NATIONAL BIOTECH STRATEGY

"Now is the time to develop a long-term agenda and national strategy for biotechnology," says Senator Patrick J. Leahy, in the Fall 1988 issue of Issues in Science and Technology. Leahy, chairman of the Senate Committee on Agriculture, Nutrition and Forestry, says that although the U.S. is currently in the biotech lead, international rivals are gaining strength.

To maintain our position, Leahy recommends both redirecting and increasing USDA's budget; modernizing the present agricultural research structure to meet new demands; investing more in applied research; modernizing the Cooperative Extension System; coordinating research projects to avoid duplication; adding training programs for scientists; supporting small biotechnology firms; using biotechnology to protect and enhance the environment; protecting biotech innovations; encouraging scientific information exchanges; eliminating overlapping agency regulations; and establishing international agreements to prevent unscrupulous researchers from moving their experiments to nations with few regulations.

### NEW BILL INTRODUCED INTO CONGRESS

Senator Max Baucus introduced the "Novel Organism Release Act" on Oct. 18. It was referred to the Senate Committee on Environment and Public Works. Although no Senate or House action was taken before adjournment, it is possible that the bill will be resubmitted when Congress reconvenes.

The bill would give the Environmental Protection Agency (EPA) authority to regulate the release into the environment of "novel organisms". The bill defines a novel organism as any living organism, including plants or animals, that has been genetically altered using techniques such as gene amplification, conjugation, transformation, transduction, cell fusion, or genetic engineering.

The bill would require EPA to: 1) prepare a manual explaining when and how to notify EPA of a proposed release; 2) establish four categories of release based on probabilities of adverse effects; 3) serve as a funnel for all initial release notices, referring some to other Federal agencies as agreed on in memoranda of understanding; 4) set up internal environmental biosafety committees; and 5) protect confidential business information and availability of information to the public.



The bill would add a new section to the Toxic Substances Control Act. Senator Baucus said he introduced the legislation "in response primarily to public concern over the potentially undesirable consequences of the release of these organisms into the environment . . . and to address the industry's need for a clear statement of our national regulatory policy on biotechnology."

#### AG BIOETHICS NEWSLETTER LAUNCHED

If your interest in biotechnology leans toward the socio-economic side, then perhaps you need to get on this newsletter's mailing list. It is a product of Iowa State University's Agricultural Bioethics Committee, which consists of faculty members from departments dealing with economics, social sciences, and humanities. Current research areas include biotechnology and its impact on university structure, evaluation of the impact of the use of growth hormones in agriculture, public acceptance, ethical issues, and notices of bioethic symposia. To begin receiving copies, call the newsletter's editor, Faye Yates, at ISU Information Service, on (515) 294-8986.

#### AUSTRALIA RIDING BIOTECH WAVE

Australian ag biotech research focuses heavily on improving animal health and production, especially for the sheep industry. The country is also working on the genetic manipulation of horticultural crops and other areas of plant and food science.

Australia's research guidelines have been in place since May 1987. They are similar to the National Institutes of Health-Recombinant Advisory Committee guidelines, but also include a review of novel organisms made by genetic manipulation techniques other than recombinant DNA. A limited number of copies of the Australian guidelines are available from OAB (202-447-9165), or contact The Secretary, Recombinant DNA Monitoring Committee, Department of Industry, Technology and Commerce, Edmund Barton Bldg., Canberra, Australia (ACT) 2600; phone (062) 72 3944.

#### MARYLAND COLLEGE PLANS BIOTECHNICIAN PROGRAM

Montgomery College, Takoma Park, Md. campus, is in the process of establishing a program to train technicians for biotechnology laboratories. A recent survey of area biotech firms showed that at least 270 more skilled people will be needed in the next two years. An advisory committee will recommend guidelines for the program, and the project should have State approval by the fall of 1990.

#### A (DNA) CHIP OFF THE OLD BLOCK

Genetic Design Inc., a biotechnology firm in Greensboro, N.C., assists state and county child support departments in determining the biological father in paternity cases. The company, which conducts 1,000 tests a week, has relied on standard lab procedures, such as tests of red blood cell markers, antigen typing, and electrophoresis to establish paternity. Now, the company will use DNA probes and biotech-based techniques to achieve even greater accuracy. The current 99 percent accuracy

rate would increase to 99.999 percent. The company intends to expand its services using DNA probes in allergy screening, forensic medicine, testing for cancer predisposition, and other specialized testing services.

#### IN CASE YOU WEREN'T THERE

- On Oct. 24-25, the Institute of Food Technologists held a workshop in Washington, D.C. on food research priorities. Representatives from various government groups discussed the kind of research required to solve problems of chemical and microbiological contaminants in the food supply, preservation and packaging methods, and diet and health.
- A transgenic animal research workshop was held at Iowa State University Oct. 26-27. Participants from Iowa State and several other universities and Federal agencies discussed guidelines for conducting transgenic animal research at Iowa State University. Ethical, scientific, regulatory, and management issues were discussed along with the potential socio-economic impact of transgenic animal research. The authors of one paper suggested that project reviewers might use a checklist of scientific and socio-economic factors, including animal costs and benefits, to assist them in ranking projects.
- Dr. Orville Bentley, Assistant Secretary, Science and Education, OAB Deputy Director Dr. Daniel Jones, and other USDA officials hosted a program on Nov. 4 at USDA for 15 distinguished Japanese food biotechnologists. Views were exchanged on safety evaluation, bioreactor systems, and current research programs in both the United States and Japan.
- "Biotechnology in our Future: The Challenge to Apply It" was the focus of a biotech symposium held Nov. 11 in Kingsville, Texas. Sponsored by Texas A&I University, a non-land grant school, and OAB, the symposium was designed to reach high school science and agriculture teachers and their students. The meeting also focused attention on the Texas agricultural experiment station, industry's role, and national issues. Dr. Alvin Young, OAB director, gave the Federal perspective on biotech issues and emphasized the need for more students to pursue ag sciences curricula at universities across the country.
- The Confinement Working Group, formed by USDA's Agricultural Biotechnology Research Advisory Committee (ABRAC), met in Chicago Nov. 11 to discuss containment levels for research projects using live recombinant Brucella abortus. B. abortus causes brucellosis in cattle. The Working Group dovetailed its meeting with the 41st Annual Brucellosis Research Conference. Brucellosis research workers presented their views as to how research on this agent might be done safely. The Working Group will make its recommendations known to the full ABRAC.
- OAB sponsored a special session, "Risk Assessment for Utilization of Microorganisms in the Environment," at the American Phytopathological Society Meeting, Nov. 13, in San Diego, Calif. The session was composed of two sections. The first section dealt with the regulatory, human health, environmental, and legislative perspectives. The second session focused on specific applications of risk assessment, such as



engineered root-colonizing *Pseudomonas*, microorganisms used in waste disposal management, and possibilities for genetic exchange.

- "The National Environmental Policy Act (NEPA): Training for Research" was the topic of a workshop held in Ballston, Va., Nov. 15-16, and sponsored by Forest Service (FS) Experiment Stations in St. Paul, Minn. and Broomall, Pa. According to Jeff Sirmon, FS Deputy Chief for Programs and Legislation, NEPA is an open analytical process rather than a guarantee of a quality environment. He added that NEPA guidelines sensitize individuals to what they are doing and reduce the risk of unwanted effects. Another panelist emphasized the need to integrate NEPA early in the planning process.

- A symposium on biotechnology was held Nov. 16-18 at Alabama A&M University, Normal, Ala. Representatives from 17 1890 schools and 200 other researchers, students, and faculty members shared views on animal, plant and food biotechnology issues. A panel discussion focused on research and academic programs in biotechnology at historically Black colleges. Dr. Alvin Young, OAB director and co-sponsor of the symposium, talked about Federal policy overview and factors that influence biotechnology policies and programs. Dr. Patrick Jordan, administrator of CSRS and another co-sponsor, described career opportunities in agricultural research. Other presentations covered food biotechnology, forestry science, animal and plant science, and the current status of plant biology in space.

- On November 17, Virginia Polytechnic Institute, Blacksburg, Va., uplinked a national videoconference, "Biotechnology: Challenges for Extension" to extension clientele across the country. The effort was supported by the Virginia Cooperative Extension Service, USDA's Extension Service, and OAB. The well-received program included instruction in basic cell biology and genetic mapping. Four-dimensional color graphics helped the viewer to visualize the scientific techniques. A discussion about ethics touched on the need for the extension agent to help farmers clarify their values and then relay this information back to the researcher. Ron Buckhalt, director of USDA's Office of Public Liaison, described the basics of public relations, stressing "an informed public is the key to effective public policy." The last hour of the program was devoted to answering viewer call-in questions.

One-half inch video tapes of the program will be made available; call Dr. Gary Weber, USDA Extension Service, for more information (202) 447-2677.

#### NEW PUBLICATIONS

"Biotechnologies: Methodologies Involved in the Production of Transgenic Animals," September 1988. NAL SRB 88-10. Prepared by Jean Larson and Suzanne Nanis. This Special Reference Brief was culled from the latest information available on selected databases. To order, see "Information, Please" news item on the first page.

Biotechnology for Crop Protection includes chapters on weed control, insect control, and plant disease control. It is co-edited by Paul Hedin of USDA and Robert Hollingworth of Michigan State University. 480 pages. It costs \$89.95. Other books also available. Contact: The American Chemical Society, Distribution Office Dept. 29604, P.O. Box 57136, West End Station, Washington, D.C. 20037.

Biotechnology for Degradation of Toxic Chemicals in Hazardous Wastes; 1988, 697 pages, \$59. Contact: Noyes Data Corp. (publishers), Mill Rd. at Grand Ave., Park Ridge, New Jersey 07656, or call (201) 391-8484.

Designing Foods: Animal Product Options in the Marketplace; 1988, 367 pages, prepared by the National Academy of Sciences, \$29.95. Contact: National Academy Press, 2101 Constitution Ave., N.W., Washington, D.C. 20418, or call (202) 334-2665.

"New Farm and Forest Products: Responses to the Challenges and Opportunities Facing American Agriculture," says diversification of agriculture and forestry must become a national priority and significant opportunities exist for farm products in industrial, non-food areas. The report includes strategies, recommendations, and proposals for turning opportunities into realities, such as forming a task force that addresses the issue of agricultural biotechnology national leadership. To obtain a copy, call USDA at (202) 447-3640.

"Biotechnology and Agricultural Cooperatives--Opportunities and Challenges," proceedings of a workshop held in Lexington, Ky., April 5-7. Contact: Jill Jensen, Committee for Agricultural Research Policy, 223 Scovell Hall, University of Kentucky, Lexington, Ky. 40546-0064.

"Biotechnology--Sorting Out Science and Fiction" is the title of a two-part article that recently appeared in Under the Sun, a newsletter published by the University of California, Davis. To obtain a copy, call Catherine Closson Vance, Editor, on (916) 752-0107.

"Emerging Biotechnologies in Agriculture: Issues and Policies," Progress Report VII, Nov. 1988. Prepared by the Committee on Biotechnology, Division of Agriculture, National Association of State Universities and Land-Grant Colleges. To receive a copy, call the Florida Agricultural Experiment Station at (904) 392-1784.

Summaries of the minutes from the March and June 1988 meetings of the Agricultural Biotechnology Research Advisory Committee (ABRAC) and three Working Groups are now available from OAB; phone (202) 447-9165.

#### CALENDAR OF MEETINGS FOR DECEMBER

Dec. 2: USDA's ABRAC Guidelines Working Group will discuss the proposed guidelines for research outside the laboratory. The meeting will be held from 9 a.m. to about 5 p.m. at USDA, 14th and Independence Ave., S.W., Rm. 3109-South Bldg., Washington, D.C. 20250; it is open to the public. Contact: Dr. Daniel Jones, Deputy Director, OAB, (202) 447-9277.

Dec. 5-6: Biotechnology '88 Mammalian Cell Culture: Current Issues in Processing and Product Recovery. The third annual international bioprocessing conference. Atlanta, Ga. Sponsored by Clemson University. Call (803) 656-3308.

Dec. 5-6: Animal Patent Conference. Ithaca, N.Y. Contact: William Lesser, Dept. of Agricultural Economics, 309 Warren Hall, Cornell Univ., Ithaca, N.Y. 14853.



Dec. 5-7: IGT Symposium on Gas, Oil, and Coal Biotechnology. New Orleans, La. Contact: Dr. Cavit Akin at (312) 567-3724.

Dec. 7-8: The Fourth National Research Council of Canada Industrial Biotechnology Conference. Toronto. Call (616) 993-9009.

Dec. 9-11: Fish Farming Expo II. Sponsored by Aquaculture Productions. New Orleans, La. Call (601) 992-0760.

Dec. 12-14: Biotechnology for Control of Growth and Product Quality in Swine: Implications and Acceptability. Wageningen Agricultural University, Netherlands. Contact: Ritzema Bosweg 32a, 6703 AZ Wageningen, The Netherlands, or phone 31 83 70 8 31 28.

Dec. 12-15: Transgenic Technology in Medicine and Agriculture. The NIH Masur Auditorium, Bethesda, Md. Contact: Penny Colbert at (301) 496-1101.

Dec. 15: "U.S. Patent Office Biotechnology Policies and Practices: An Overview". Gaithersburg, Md. Contact: Montgomery County High Tech Council at (301) 762-6325. Reservations needed.

Jan 5-6: Meeting of USDA's ABRAC. Items on the agenda include developing guidelines for agricultural research, a field handbook, and issues that address biological confinement of organisms used in research. The meeting is open to the public and will take place at USDA, 14th and Independence Ave., S.W., Rm. 104-A, Administration Bldg., Washington, D.C. 20250. The meeting times are 9 a.m. to about 5 p.m. on Jan. 5 and 9 a.m. to about 3 p.m. on Jan. 6. For more information, contact Dr. Alvin Young, ABRAC Executive Secretary, on (202) 447-9165.

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Biotechnology Notes is written and edited by Marti Asner, a public affairs specialist on assignment to OAB. Suggestions for items to include in future issues are always appreciated and may be sent to: USDA/OAB, 14th and Independence Ave., S.W., Room 321-A, Administration Bldg., Washington, D.C. 20250; or phone (202) 447-9165.

